Skein 5

Salmon Habitat

Overview:
This skein gives students the opportunity to:

- **P / I** Select, discuss, and review rules a site for on-site stream studies
- **I** Conduct and then discuss the stream studies

Big Ideas:

- A stream or lake may be a salmon's home for part of its life cycle. Streams and lakes with certain features will be attractive to salmon.

Vocabulary:

streambed, stream bank, lake, gravel, riffle, pool, habitat, polluted, garbage

Important Standards Netted by Teaching Skein 5

SCIENCE

	Fourth Grade	Fifth Grade	Sixth Grade
Rules for Salmon Habitat Study	SA 1.1	SA 1.1	SA 1.1
	SA 1.2	SA 1.2	SA 1.2
	SA 2.1	SA 2.1	SA 3.1
	SA 3.1	SA 3.1	SC 3.1
	SC 2.2	SD 1.1	
	SC 3.1		
	SD 1.1		

MATH	Third Grade	Fourth Grade	Fifth Grade	Sixth Grade
Field Trip	M 2.1.1	M 2.1.1	M 2.1.1	M 2.1.1
	M 2.1.3	M 2.2.3	M 2.2.3	M 2.2.3
Habitat Survey Data	M 1.3.4	M 3.2.1	M 3.2.1	M 3.2.1

READING

Field Trip	R 1.1	R 2.1
	R 1.5	R 2.5
	R 1.4	R 2.4

WRITING	Fourth Grade	Fifth Grade	Sixth Grade
	W 2.1.2	W 2.1.3	W 2.1.3
	W 2.2.2	W 2.2.2	W 2.2.2
			W 2.2.4

BACKGROUND INFORMATION

WATER CYCLE

Alaska's salmon spawn in streams and lakes, and many species spend a year or more in the stream or lake after they hatch. Salmon habitat is easily damaged by logging and mining activities, by urban and industrial construction, and by pollution. Many of these practices are changing to protect streams and revitalize streams that have been damaged in the past.

Water. At every stage in their life, salmon need clean water that is approximately between 40°F and 50°F and which contains oxygen. A healthy salmon stream has a mix of fast running water and deep pools. Fast running water washes over rocks in riffles and picks up oxygen. Deep pools that form at the edge of a stream and in the water behind rocks, logs, or other debris allow salmon to rest from the current and hide from predators. Cloudy water contains silt and mud that can smother eggs and irritate the gills of young salmon. Cloudy water also makes it harder for salmon fry to find and catch food.

Young salmon are very sensitive to pollutants in the water. Household chemicals like bleach, soap, oil, or paint can be fatal if people dump them into a stream. Many pollutants enter streams through storm drains, which carry rainwater from paved streets to nearby streams. Pollutants dumped down storm drains can kill salmon and wildlife in nearby streams.

Stream banks and lake shores. The gravel bottom of a salmon stream or lake contains a mix of rock sizes. Salmon need gravel to spawn, but once the alevin emerge, the presence of pools and riffles are more important. The slope and curves in the streambed are important to control the flow of water and reduce flooding during storms.

Stream banks lined with plants soak up water during heavy rain and release it slowly into the stream. Marshes and similar wetlands also absorb rainfall to prevent flooding and reduce the chance of streams and lakes drying out in hot weather. Bushes and trees growing along the banks of a stream create shade, keep the water cool in the summer, keep the banks stable, and allow salmon to hide in the shadows. Insects live in the vegetation along the banks and fall into the water as food for salmon. To protect the stream banks, laws prohibit construction or logging near the streams.

Food. Salmon fry catch tiny insects that float past them. As they grow, the salmon can catch larger insects and caterpillars that fall into the stream or lake, as well as mayflies and stoneflies that land on the water to lay their eggs. When they are large enough, the salmon can eat smaller fish in the stream or lake.

People. People disturb streams and lake shores and their natural residents when they remove the vegetation, divert the water flow, pollute the water, or build docks. People can erode the banks by playing or driving along the edges of a stream or lake. They can crush salmon eggs in the gravel or expose them at this very sensitive stage. People and pets sometimes harass spawning salmon in shallow streams or leave garbage at the site.

But people can also protect and restore streams and lakes. Many groups and individuals act as streamkeepers, conducting stream inventories, monitoring environmental health, working for the streams' protection, and replanting and restoring streams that have been damaged or buried in culverts. People should be conscious that they share the stream with others and that every organism contributes to the health of the ecosystem.

If I Were A Salmon

Materials:

- ✏ Copies of Handout 5.1, "Rules for Salmonid Habitat Study," for each student
- ✏ Copies of Handout 5.2, "A Healthy Salmon Habitat," for each student

Time Required:

One lesson, plus follow-up time after the field trip

Level of Conceptual Difficulty:

Simple to moderate

Evidence for Assessment:

Monitor class discussion to ensure that student can identify features of a healthy salmon habitat.

ADVANCE PREPARATION

- ☞ Review any rules your school has regarding student safety around water and ensure that adequate precautions are in place. Some streams and lakes may be hazardous for young children, particularly if there are strong currents, slippery rocks, or unstable banks.

- ☞ If possible, tell the students that you have selected a variety of sites for a salmon habitat study and ask them to choose the site they would prefer to visit.

- ☞ Arrange adequate supervision from parent helpers or other volunteers. Most sites cannot provide supervision, although those with school programs can provide information and activities when informed in advance. If there is an on-site program, check what it offers and how to prepare the class.

- ☞ Walk the site before the class visit to check for appropriateness, safety, and educational opportunities.

- ☞ Prepare the handouts and other materials students will need. Arrange permission, as required by your school. Advise students to bring warm clothing, waterproof boots, a snack, and a backpack.

- ☞ These activities make a valuable extension to the skeins on the egg, alevin, and fry, especially if your school has a classroom egg incubator tank and will be releasing fry.

- ☞

INTRODUCTION

- ☞ Have the class brainstorm answers to the question, "If I were a salmon, what kind of habitat would I want?" If necessary, prompt them with questions, such as:

  - ○ What kind of water would you want?
    Cold, clean, fresh-running, with riffles and still ponds.

- What would you want at the bottom of the stream or lake?
  Clean gravel and rocks.
- What would you want on stream banks?
  Shady, overhanging vegetation.
- What would you want to eat?
  Insects, smaller fish, bits of plant and animal debris.

RESEARCH/DISCUSSION

☞ Have students, in small groups, use Handout 5.2, "A Healthy Salmon Habitat," to research and list items they would find in good salmon habitat.

SUMMATION

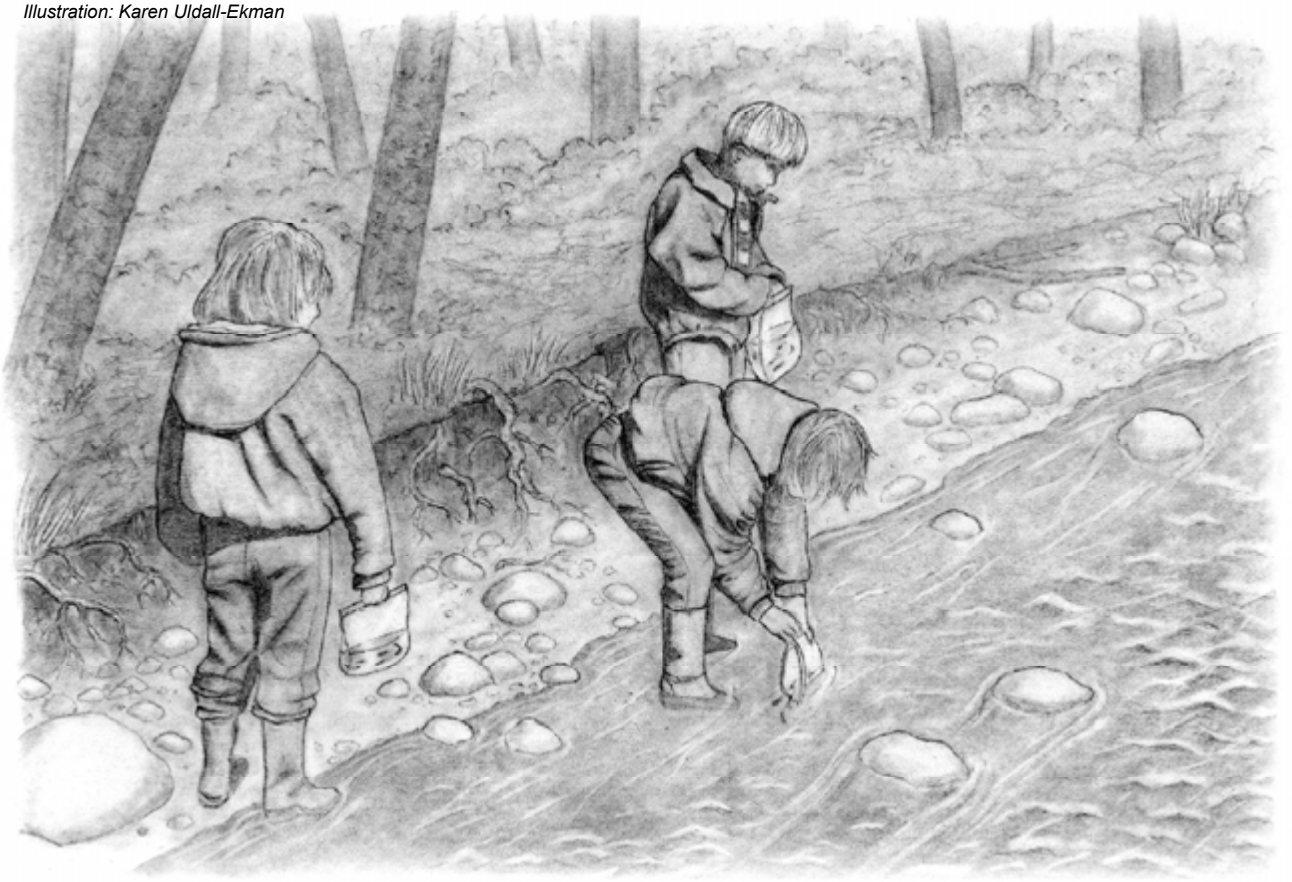
☞ Help the class make a list of plants, animals, and other objects to look for when they are at a stream or lake and to decide whether or not each item is good for salmon. Discuss how students will make and record their observations on the salmon habitat study: taking notes, drawing, taking photos, video and/or audio recordings, etc.

P/I

Rules For Salmonid

Handout 5.1

Illustration: Karen Uldall-Ekman



1. Follow directions.
2. Stay in your groups.
3. Walk only. Do not run.
4. Play only where allowed.
5. Stay on the paths.
6. Do not pick plants.
7. Do not disturb fish or other animals.
8. Take your things with you when you leave.

A Healthy Salmon Habitat

Handout 5.2

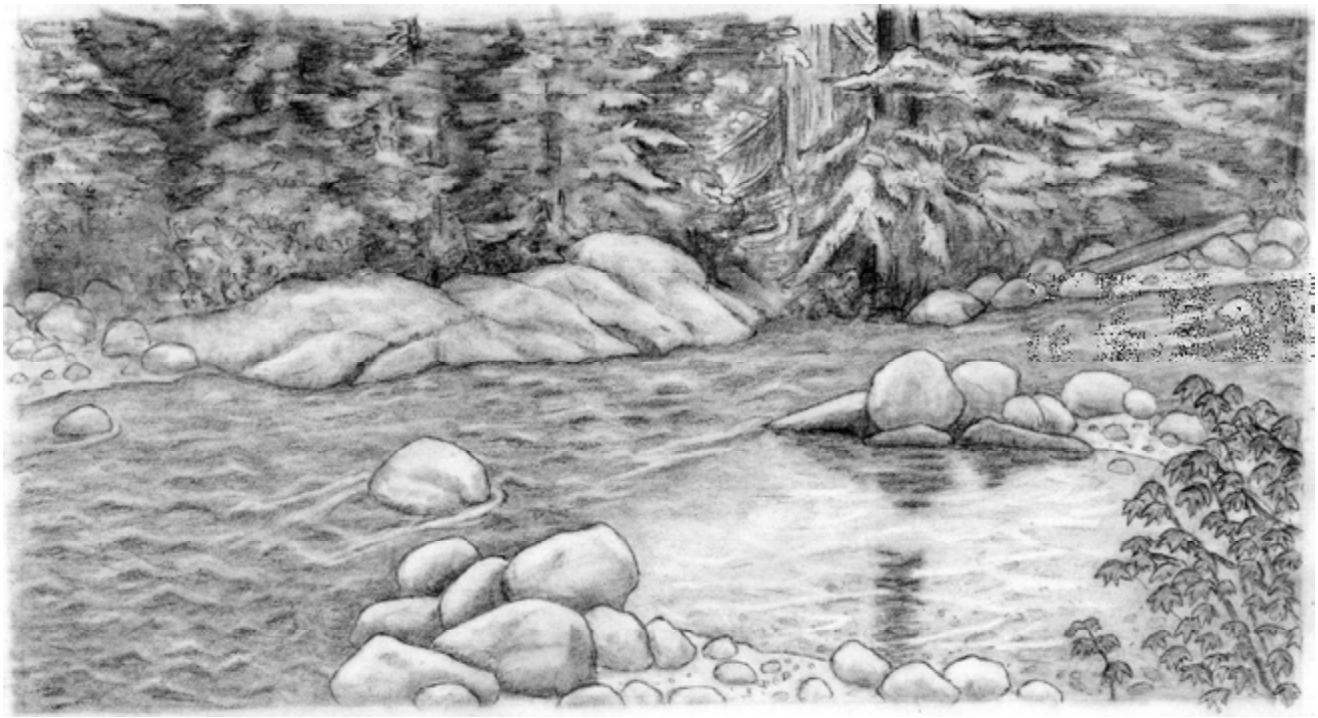


Illustration: Karen Uldall-Ekman

Salmon need many things to make a home.

Salmon live in streams and lakes. They like cold water. The water must run fast. It must be clean. Salmon also like to rest in still pools.

The lakebed or streambed must have clean rocks and gravel. Gravel is a mix of small stones and sand. Salmon do not like mud or dirt.

Salmon need bushes and branches to shade the water. The shade keeps the water cool. Salmon can hide in the shade.

If a lake or stream has all these things, it is a good home for salmon.

Do not play in a salmon stream. Salmon do not like to be disturbed.

What To Look For

Materials:

- Copies of Handout 5.3, "Salmon Habitat Study No. 1," for each student
- Copies of Handout 5.4, "Salmon Habitat Study No. 2," for each student
- Writing supplies
- Chart paper

Time Required:

One lesson, plus follow-up time after the field trip

Level of Conceptual Difficulty:

Simple

Evidence for Assessment:

Review student handouts and monitor in-class discussion to ensure that the students can observe and describe a variety of phenomena from nature.

INTRODUCTION

- Shortly before the field trip (earlier in the day if feasible), have small groups of students use Handout 5.3, "Salmon Habitat Study No. 1," to list things they think they will see.

- Have the groups report their lists to the class and make a class list on a chart.

- Have the class divide the list into items from nature and items from humans.

RESEARCH/DISCUSSION

- Give the students copies of Handout 5.4, "Salmon Habitat Study No. 2," and have them use it on the field trip to write or draw their observations. Stop several times during the field trip and have students record their observations on the handout.

- Following the field trip, have students read their notes or describe their observations to the class.

SUMMATION

- Discuss with the class similarities and differences between their observations and the list of what they expected to see. If necessary, prompt them with questions, such as:

  - What did you observe that you did not think of before the field trip?
  - What were you expecting that you did not observe?
  - What did you think would be most interesting and what turned out to be most interesting?
  - Did you see more or less items from humans than you expected?
  - Why were there differences between what you expected and what you observed?

NOTE

- These handouts would be good accompaniment to your egg-take field trip.

P

On The Salmon Habitat Study, No. 1

Handout 5.3

Name _____

On the salmon habitat study, I think

I Will See

I Will Hear

I Will Touch

I Will Smell

P

On The Salmon Habitat Study, No. 2

Handout 5.4

Name _____

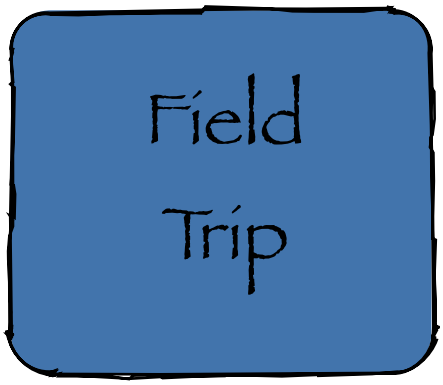
On the salmon habitat study,

I See

I Hear

I Touch

I Smell



This activity will be most meaningful when repeated over time (e.g., visit the chosen stream in both the fall and spring). Teachers could research the historical characteristics of the stream or arrange for a guest speaker to share his or her knowledge.

Materials:

- ✏ Copies of Handout 5.5, "Salmon Habitat Survey and Data Sheet," for each student
- ✏ Thermometer
- ✏ Meter stick

Time Required:

Several hours for field trip

Level of Conceptual Difficulty:

Moderate

Evidence for Assessment:

Monitor student discussions and notes to ensure that the students can describe the site and identify features about the habitat that make it suitable for salmon.

INTRODUCTION

- ☞ Assemble the class in groups of four or five, each with an adult supervisor. Remind the class of the class rules for habitat study.

INVESTIGATIONS

- ☞ Option: Have different groups of students take a five-minute walk, each focusing on one specific thing.
  List all the colors you can identify; List all the sounds you hear; List all the smells you can; List all the trees or leaves you can find; List all the things you can see on the ground; List all the things less than one centimeter in size; etc.

- ☞ Have the groups reassemble and compare the results of their walks on-site or in class.

- ☞ Have the class walk to the stream or lakeshore. Have students identify features that would identify the site as good or bad for salmon.
  Clean, cold running water, gravel stream bottom, vegetation on stream banks, insects for food.

- ☞ Have them carefully look for signs of salmon or other fish in the water. Have them record their observations.

- ☞ Have students in pairs or small groups use Handout 5.5, "Salmon Habitat Survey and Data Sheet," to record information about the stream. If necessary, have the adult supervisor lead students through the survey.

- ☞ Have the class look for evidence of people near the stream or lake.
  Signs, construction, trails, pipes, waste, etc.

- ☞ Have the students record their observations.

- ☞ Have the class look for things they could do to make the site better for salmon and other animals.
  Remove waste, restore minor damage, etc.

Salmon Habitat Survey & Data Sheet

Handout 5.5

Name_____ Date_____

Materials:

- **4** Thermometers
- **4** Meter sticks

1. How cold is the water?
   Use a thermometer. Hold it in the water for one minute.

   The water is _____ degrees Celsius.

2. How deep is the water?
   Use a meter stick. Do not go more than 50 cm deep.

   The water is _____ centimeters deep.

3. How clear is the water?

   The water is: clear / muddy

4. Look at the stream or lake bottom. What kind of rocks does it have?

   mud / gravel / boulders

5. Look at the stream or lake sides. What kind of plants does it have?

   none / low bushes / trees

Salmon Habitat Study Field Trip

[research/discussion]

Materials:

- Copies of Handout 5.6, "Habitat Survey and Data Sheet," (Parts 1 & 2), for each student
- HACH field testing kits to measure dissolved oxygen
- pH testing kit
- Thermometers for measuring air and water temperature
- Meter sticks or other measuring tools
- Stopwatch or other watch with a second hand
- Writing and drawing supplies

Time Required:

Several hours for field trip

Level of Conceptual Difficulty:

Simple to moderate

Evidence for Assessment:

Monitor student discussions and review their written observations to ensure that the students can describe the site and identify features that make the habitat suitable for salmon.

ADVANCE PREPARATION

- Review your school's field trip guidelines. Then review Advance Preparation (Page 4) and contact State Fish and Game for additional resources.

FIELD RESEARCH

- Assemble the class into five groups, with an adult supervisor for each group. (Adult supervisors can also rotate between groups if fewer than five are available). Remind the class of the class rules for habitat study.

- Option: Have the class walk the banks of the stream or lake, either together or in their groups. Every two to three minutes stop and have students describe the general sights, sounds, smells, and other characteristics of the site. Have students write or draw their observations in the salmon science notebook. Have students sketch a map of the site.

- Have students, in their groups, use Handout 5.6, "Habitat Survey and Data Sheet," (Part 1), and/or Handout 5.6, "Advanced Habitat Survey and Data Sheet," (Part 2), to record information about the stream. Have the class walk to the stream or lakeshore. Have students identify features that would identify the site as good or bad for salmon.

- Note: you may wish to laminate the handout sheets for future reuse, in which case overhead pens may be required for recording information.

- Have the class look for evidence of people near the stream or lake.
  Signs, construction, trails, pipes, waste, etc.

- Have the students record their observations.

☞ Have the class look for things they could do to make the site better for salmon and other animals.

Remove waste, restore minor damage, replant shoreline vegetation, etc.

Illustration: Donald Gunn

Habitat Survey and Data Sheet[I]

Handout 5.6, (Part 1)

Name _____

Name of stream or lake_____

Habitat checklist

Check the box if you see any evidence that the stream or lake meets these conditions.

- ☐ The stream or lake bed has clean gravel.
- ☐ The stream or lake has clean flowing water
- ☐ The stream or lake does not dry up.
- ☐ The stream or lake floods easily.
- ☐ The stream or lake is not blocked by waterfalls.
- ☐ The stream or lake has vegetation on its banks.
- ☐ There are signs of animals near the stream or lake.
- ☐ The stream or lake is not damaged by people.
- ☐ The stream or lake is cared for by people.

Does the stream or lake appear to be a good salmon habitat? What makes it look like a good or poor habitat?_____

_____

_____

_____

What could be done to make the stream or lake a better habitat for salmon?_____

_____

_____

_____

Who could do something to make the stream or lake a better habitat for salmon?_____

_____

_____

_____

Other evidence you observe _____

_____

_____

Habitat Survey and Data Sheet I

Handout 5.6, (Part 2)

Physical characteristics of the stream or lake banks and bottom					
1. Stream or lake bank Estimate the portion of the bank that is made up of:	N/A	25%	50%	75%	ALL
Bedrock (solid rock):					
Boulders (rock pieces of 30 cm across or larger)					
Cobble (rock pieces of 10 to 30 cm across)					
Gravel (rock pieces 1 to 10 cm across)					
2. Stream or lake bottom Estimate how much of the bottom is made up of:	N/A	25%	50%	75%	ALL
Bedrock (solid rock):					
Boulders (rock pieces of 30 cm across or larger)					
Cobble (rock pieces of 10 to 30 cm across)					
Gravel (rock pieces 1 to 10 cm across)					
Sand					
Mud					
3. Plant life along the stream or lake banks Estimate the portion of the bank with the following types of vegetation:	N/A	25%	50%	75%	ALL
Tall trees					
Low bushes					
Overhanging bushes					
Ferns					
Grass					

SALMON HABITAT STUDIES

WRAP-UP

EVIDENCE FOR SKEIN ASSESSMENT

- ☞ Have students describe in writing or draw one or more things they did not know before the field trip or one thing they found interesting on the field trip.

- ☞ Have students complete a stem sentence, such as, "I used to think... about salmon habitat but now I know that...," or, "One thing I learned about salmon habitat is...".

- ☞ Have students add their materials to their salmon science notebook and write a sentence explaining what they learned.

LANGUAGE AND ARTS INTEGRATION

- ☞ Invite a local naturalist or other resource person to the class to prepare students or to lead the visit. For information, contact local organizations, such as the Alaska Department of Fish and Game.

- ☞ Arrange a visit to another type of salmon resource, such as a local hatchery or salmon enhancement project, a local spawning stream or lake, a salmon processing facility, or a commercial fishing boat. Discuss the kinds of jobs people hold that involve working with salmon.

- ☞ Have students imagine the site from a bird's-eye view. Have them identify the main visible features, such as the road, parking lot, stream, clearings, trees, and buildings. Have students draw the site as they would see it if they were a bird flying overhead.

- ☞ Arrange for the class, or for a group of students, to view the site at different seasons and to compare their observations using notes, illustrations, photos, or other media.

- ☞ Have students make a map of a local stream or lake, showing its main features and ways to protect these features from damage.

- ☞ Have the class paint a mural showing the site and labeling features that salmon would like.

HOME CONNECTIONS

- ☞ Have students guide an adult around a stream or lake and identify features about the stream or lake that salmon would like.

SALMON HABITAT: ON-SITE STUDIES

WRAP-UP

EXTENSION AND INTEGRATION

- ☞ Invite a local naturalist or other resource person to the class to prepare students or to lead the visit.

- ☞ Arrange a visit to another type of salmon resource, such as a local hatchery or salmon enhancement project, a local spawning stream or lake, an estuary, a salmon-processing facility, or a commercial fishing boat. Discuss the kinds of jobs people have working with salmon.

- ☞ Have students imagine the site from a bird's-eye view. Have them identify the main visible features, such as the road, parking lot, stream, clearings, trees, and buildings. Have students draw the site as they would see it if they were a bird flying overhead. Obtain an aerial photograph of the site from the local planning office and have them compare their views with the photograph.

- ☞ Arrange for the class, or for a group of students, to view the site at different seasons and to compare their observations using notes, illustrations, photos, or other media.

- ☞ Have students make a map of a local stream or lake, showing its main features and ways of protecting them from damage. Alternatively, have students add the features they observed to a topographical map of the site.

- ☞ Have the class paint a mural showing the site and labeling features that salmon would like.

- ☞ Build a mock stream. Have the water flow across the mock stream and discuss the anatomy of the stream. Modify the stream and see how it impacts the water. Predict what will happen to the salmon habitat with the changes.

EVIDENCE FOR SKEIN ASSESSMENT

- ☞ Have students make notes listing at least six important ideas or facts about the stream they studied.

- ☞ Have students share their lists in pairs and negotiate an agreement on the four most important ideas about the stream they studied.

- ☞ Have the pairs share their ideas with the class and discuss any differences between the lists the different pairs negotiated.